The HathiTrust+Bookworm project

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Current Prototype

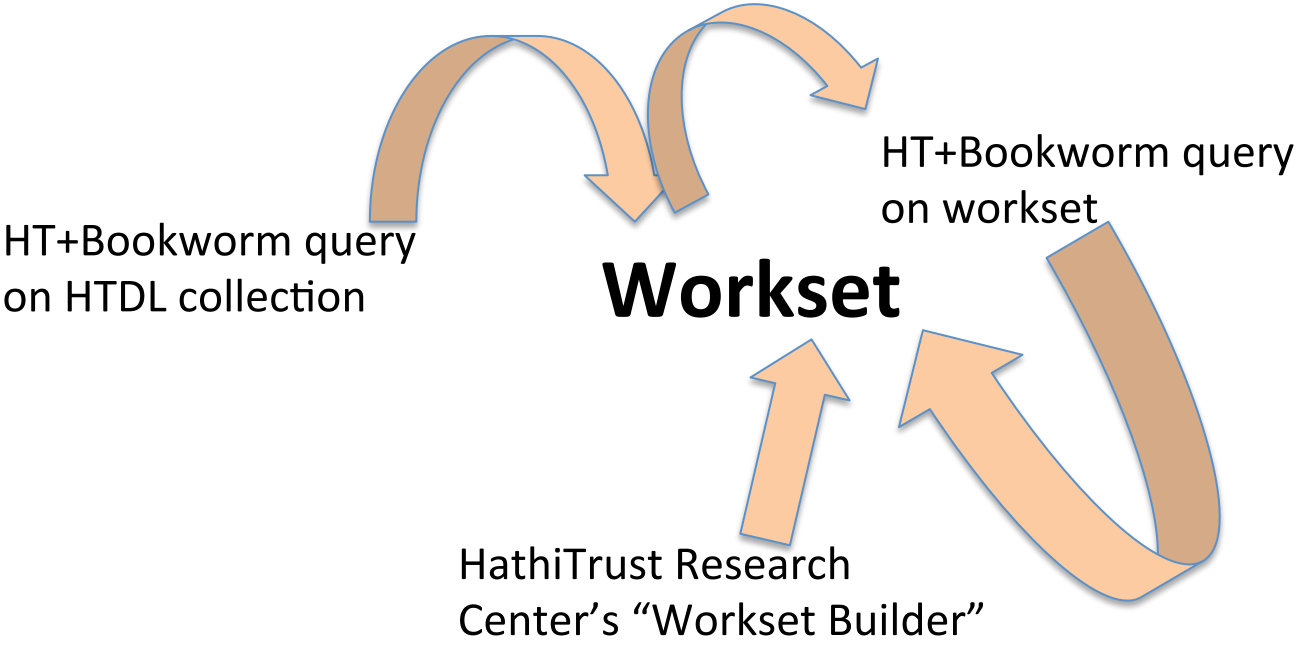
- The current prototype of HT+Bookworm is set up to work with ~5.2 million public domain volumes in the HathiTrust Digital Library
- Go to htrcbookworm.wordpress.com
  - Then click on "Try the prototype"

First Advantage: Worksets

- HTDL has a rich notion of workset
  - A workset is a user-determined sub-collection from the HTDL's collection
    - so called because it is a set of books meant to be worked on by algorithms for text analysis
- HT+Bookworm leverages the workset functionality
  - HT+Bookworm will eventually:
    - query a specific workset (rather than the entire collection)
    - generate a specific workset from the result of a faceted query

First Advantage: Worksets

- Synergy with HTDL’s workset functionality



HT+Bookworm query on HTDL collection

Workset

HT+Bookworm query on workset

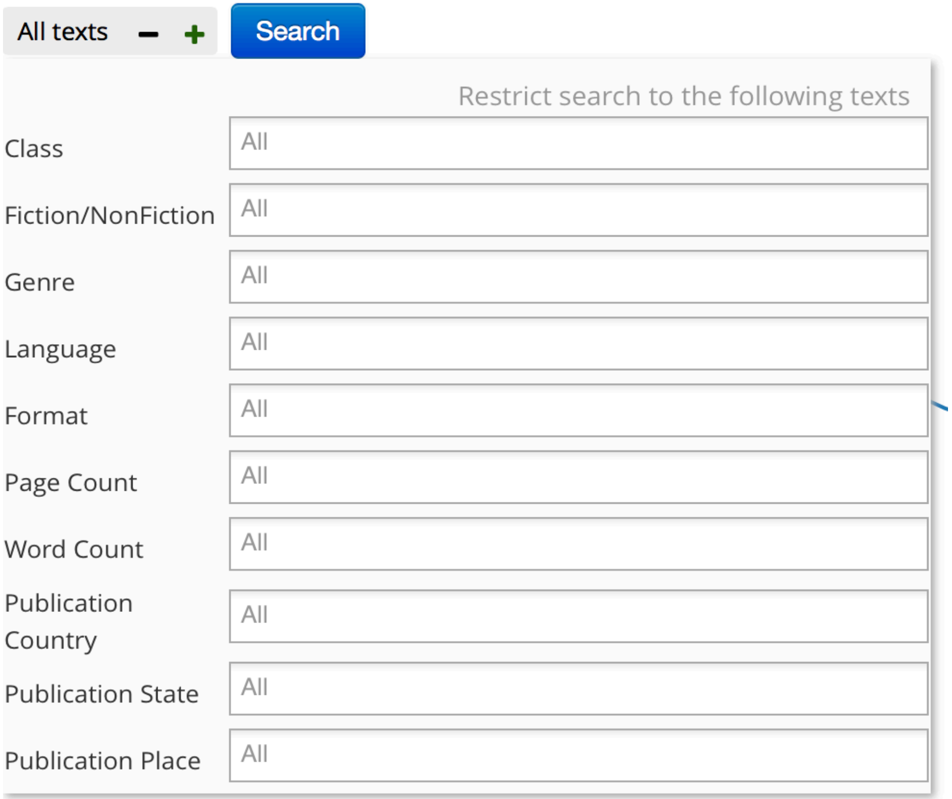
HathiTrust Research Center’s “Workset Builder”

Workset creation and refinement with HT+Bookworm

Worksets are persistent subcollections of the HTDL

Second Advantage: HT Metadata!

- The HTDL has good and detailed metadata (relatively speaking)!
  - Historically, metadata was meticulously created by librarians at HTDL's contributing libraries
    - allows for highly faceted queries



Restrict search to the following texts

Class	All
Fiction/NonFiction	All
Genre	All
Language	All
Format	All
Page Count	All
Word Count	All
Publication Country	All
Publication State	All
Publication Place	All

Meeting Point of Scientific and Humanistic Inquiry

Scientific Inquiry

- *Generalization* across entities
- Discovery of *patterns* across entities
- A *determinate* epistemology

Humanistic Inquiry

- Close engagement with *specific* entities
- Attending to *singular* instances among entities
- A *skeptical* epistemology

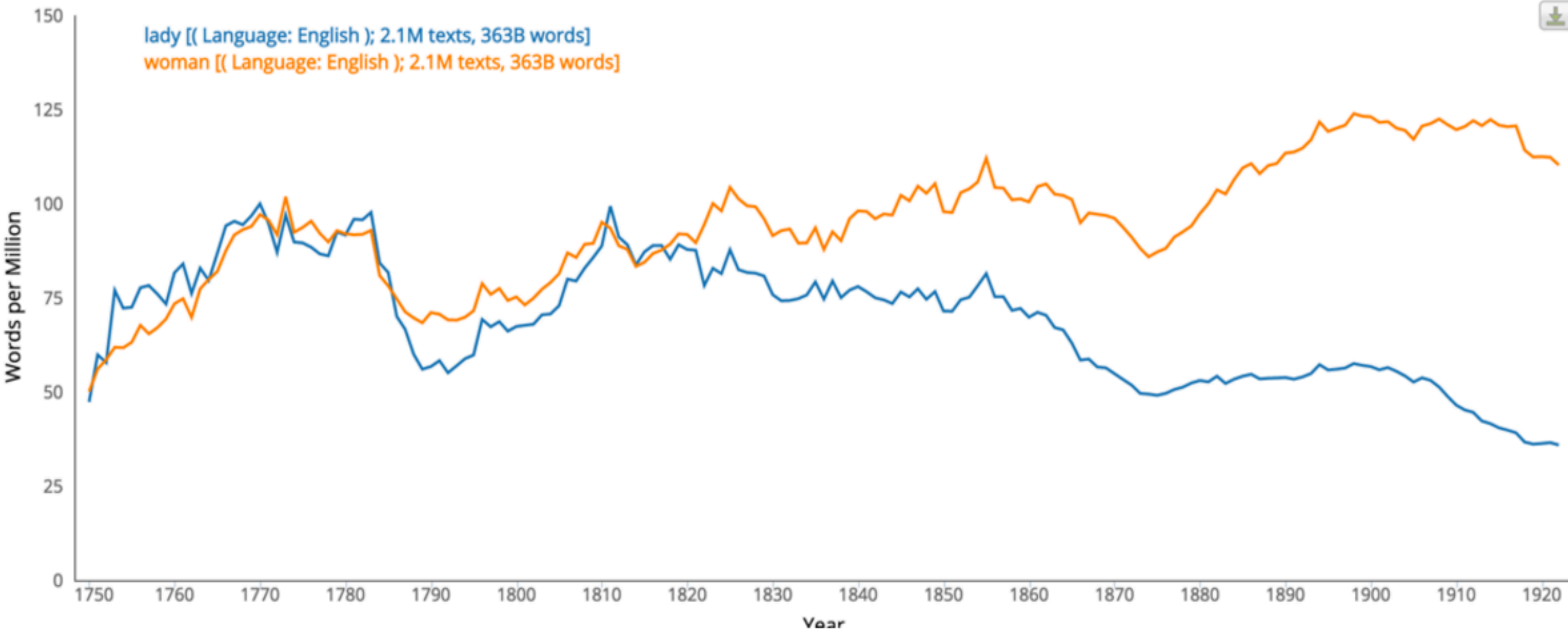
Three Use Cases

How, *across time*

1. change in social context correlates with change in preponderance of one word-concept over another
2. occurrences of related word-concepts in multiple languages/places compare with each other
3. domains/contexts of words vary

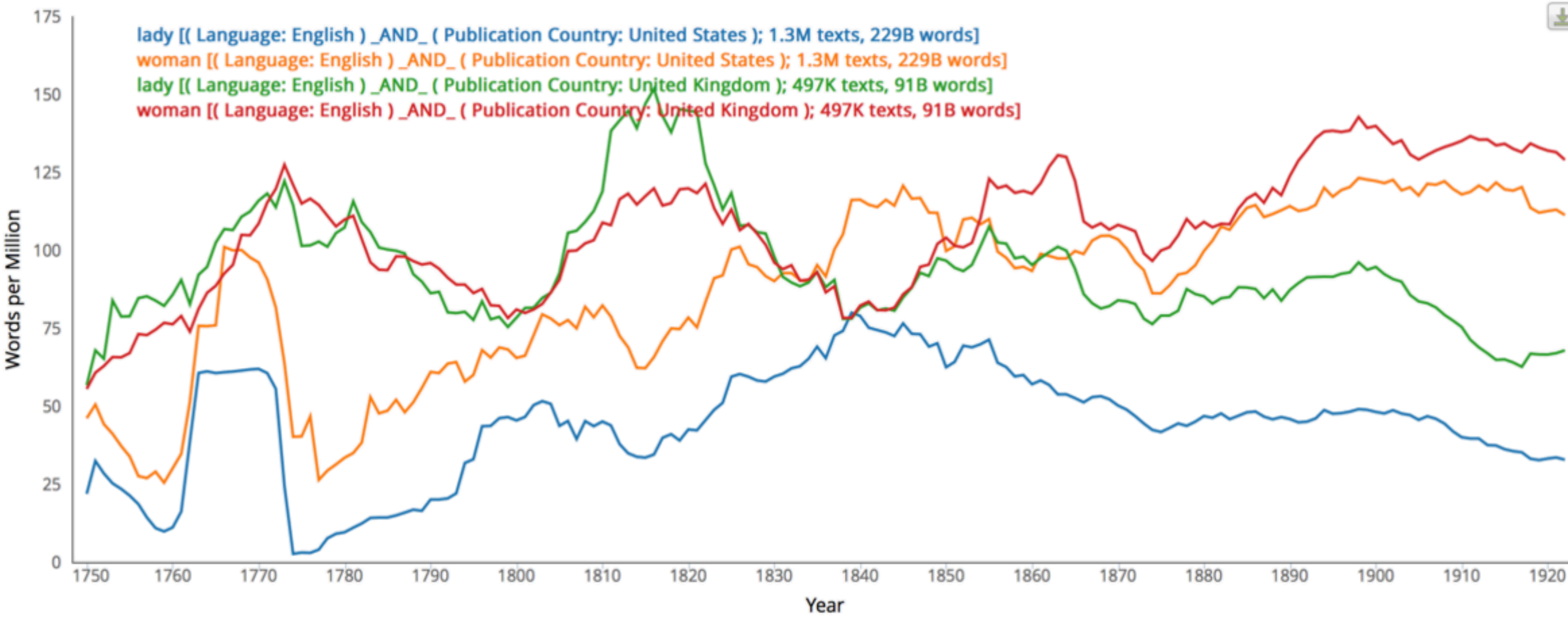
Case #1

Change in social context correlates with change in preponderance of one word-concept over another



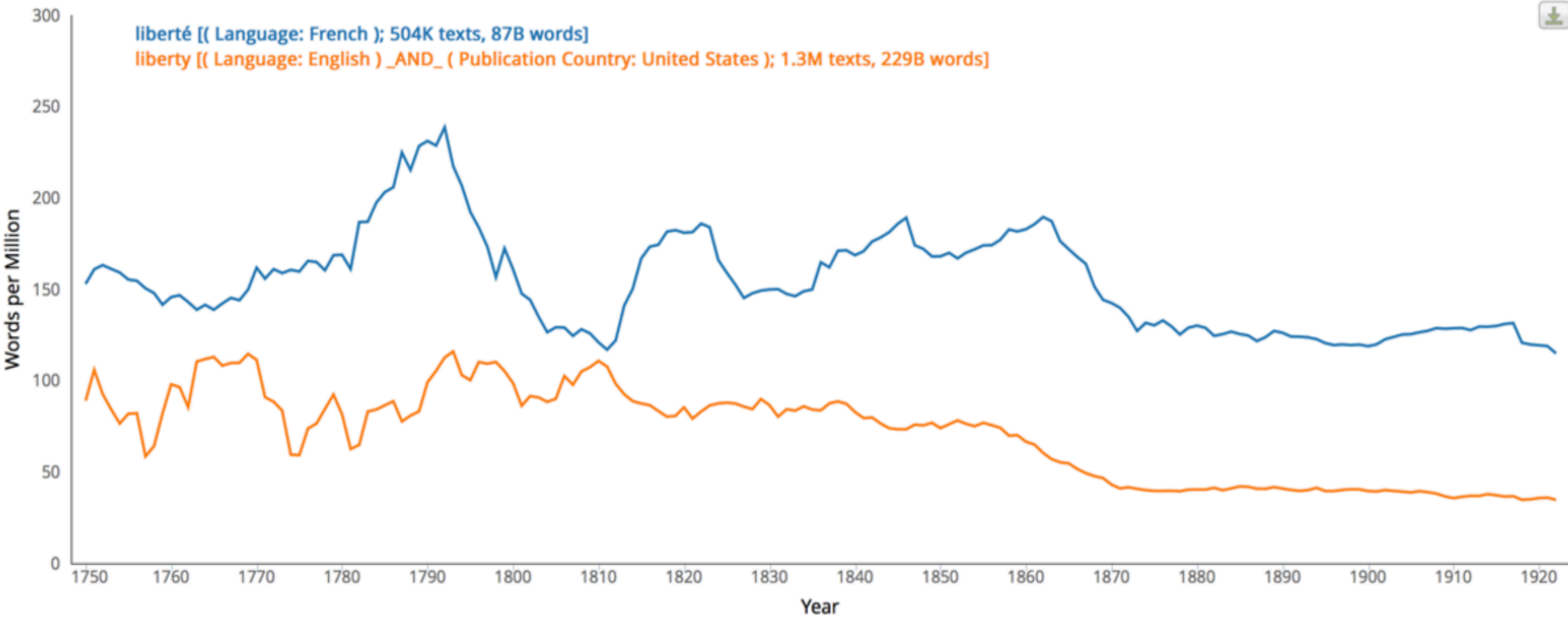
Case #1

Change in social context correlates with change in preponderance of one word-concept over another



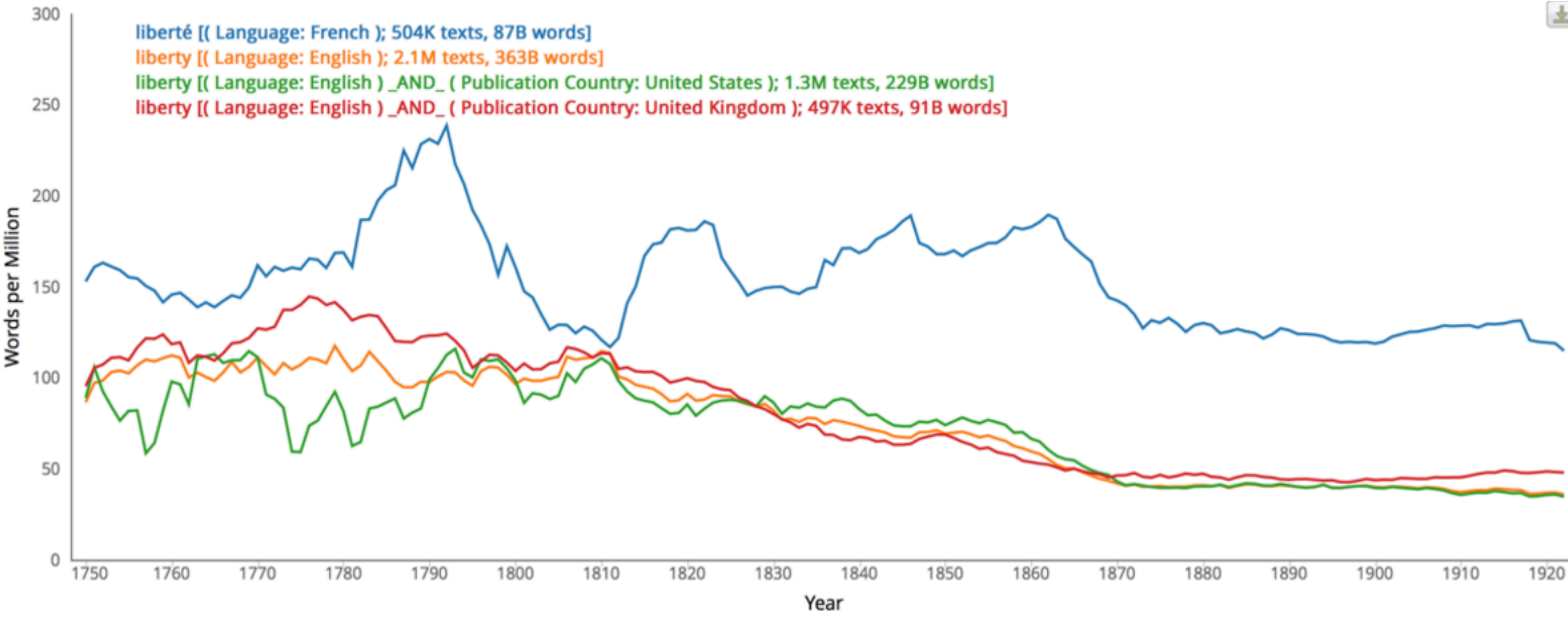
Case #2

How occurrences of related word-concepts in multiple languages/places compare with each other



Case #2

How occurrences of related word-concepts in multiple languages/places compare with each other



Case #3

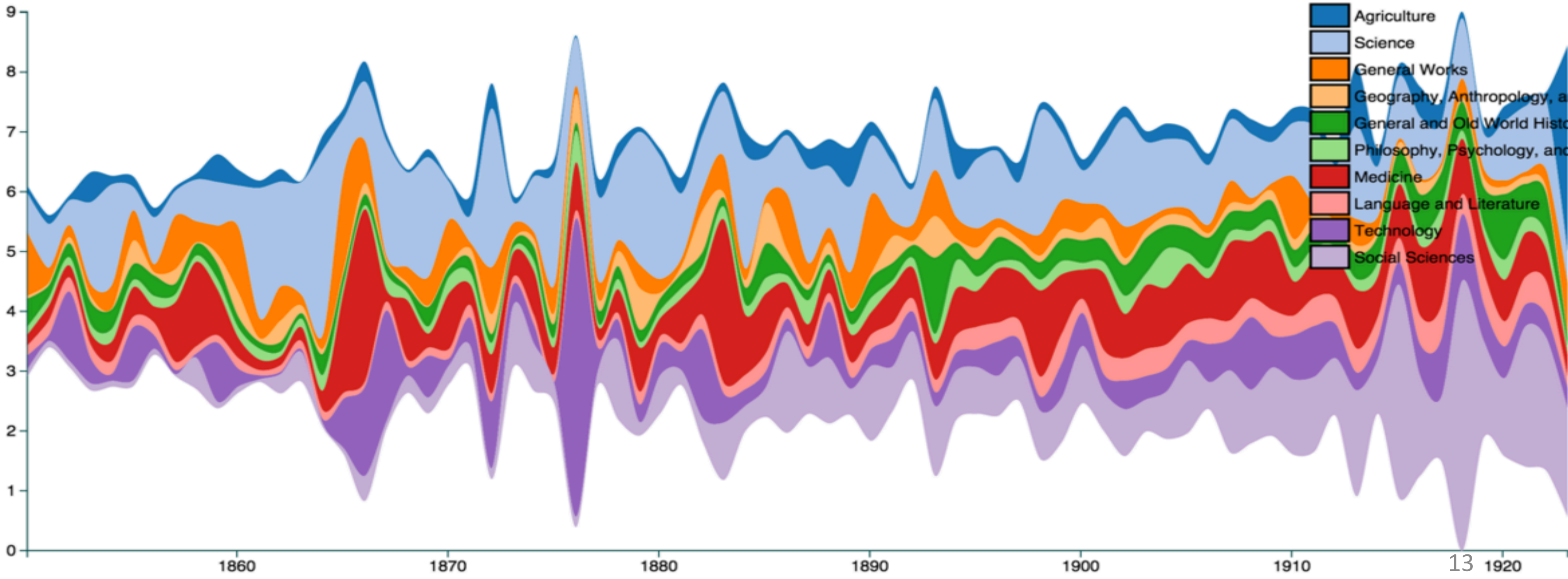
How domains in which a word occurs vary across time

- Not yet integrated into the public-facing prototype
- To see the pilot version, go to: bit.ly/1PzkcUK
  - Enter the word you want to search for in the field marked "word limited to" and press "return"
  - Click the "Show Advanced" button
  - Do not change the contents of the "x representing", "y representing", etc. fields

Case #3

How domains in which a word occurs vary across time

“depression” with Library of Congress categories, 1850-1923
Higher resolution: bit.ly/1QatsPs Streamgraph: bit.ly/1Ilytgo



Taking a Step Back

What is the *overall Bookworm philosophy*?

- Normal search engines are very good at finding *individual* texts in a library
- Bookworm, however, is good at *something* else:
  - Finding and understanding *categories* in a library
    - The category is plotted along the x-axis
    - The simplest use case is: plotting the usage of a *word* across *years*:
      - Goal: to understand something about the x-axis (the category) through the usage of that word
    - The x-axis can also be defined by *ordinals* (i.e. discrete categories) — e.g. "languages" along the x-axis — rather than *cardinals*

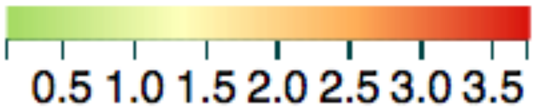
Adapted from Ben Schmidt, "Bookworm API Philosophy" – bit.ly/1K3oUDF

Plotting Against an Ordinal Category

Heatmap color represents: Words-per-million, for the word "**annul**"
X-axis: Four binned book-page-length categories (small, medium, large, extra-large).
Library of Congress classes "**History of America**" and "**Law**" show the most incidences of "annul" .
Law books are often thick doorstoppers!

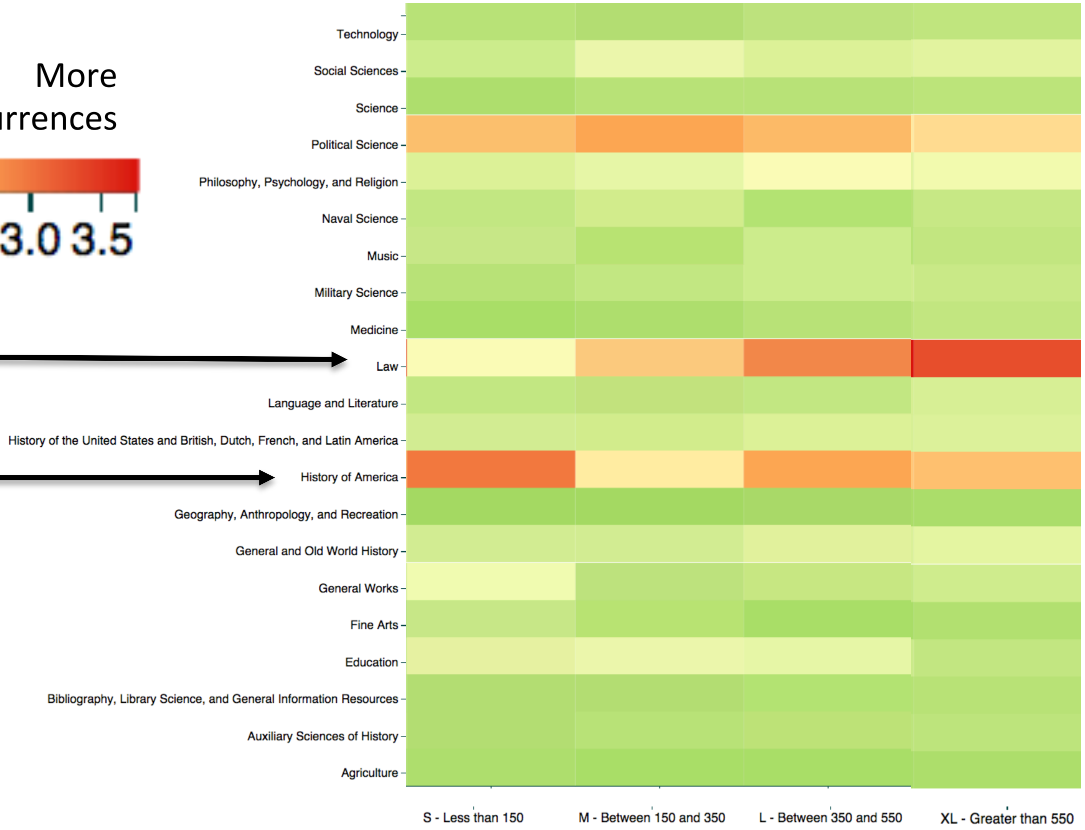
Less occurrences

More occurrences



Law

History of America



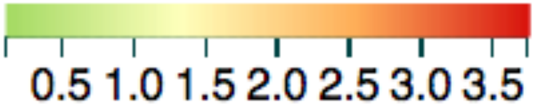
Small Medium Large Extra-Large

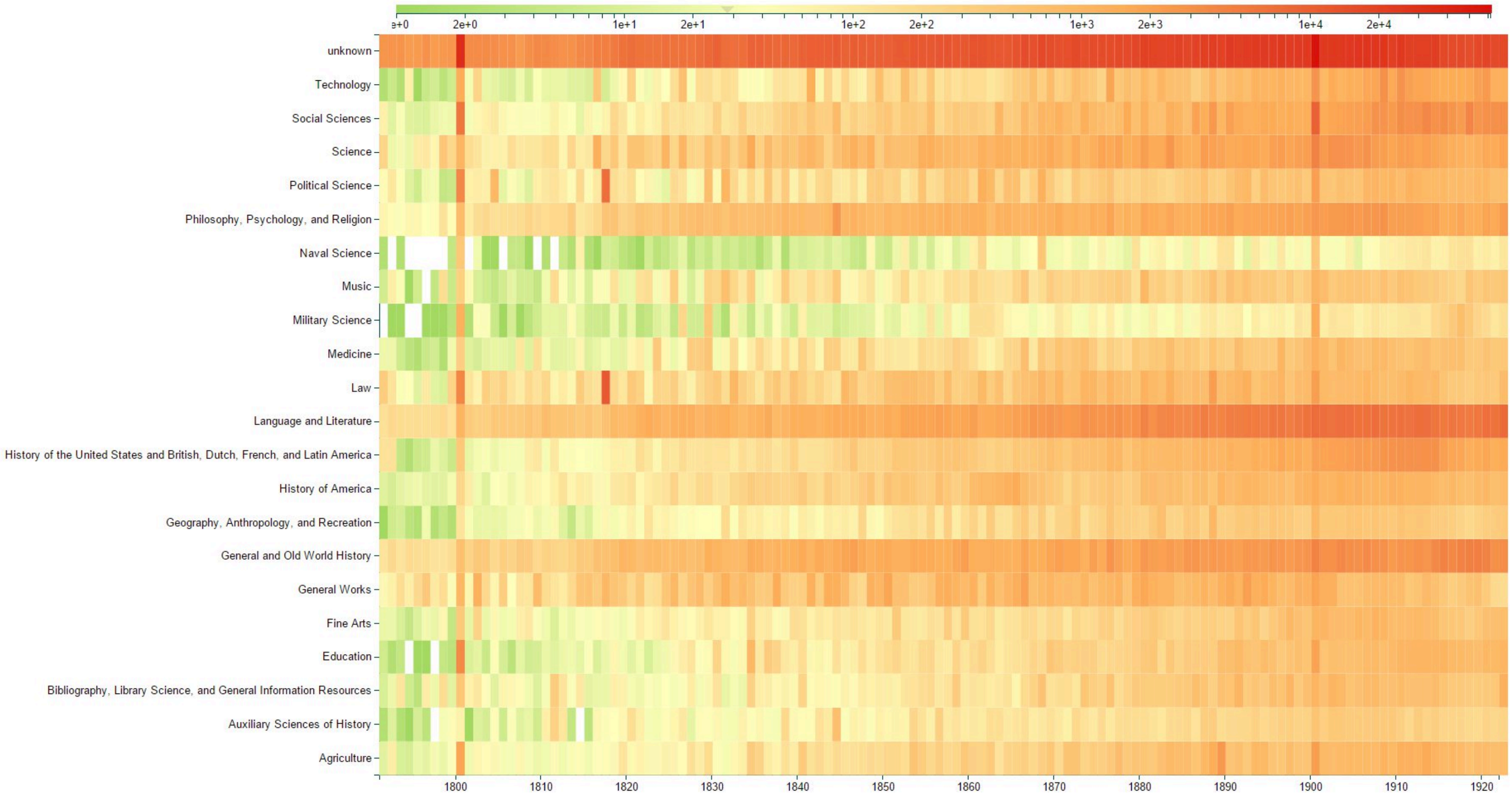
Characterizing a Library’s Contents

Coverage of Lib. of Congress classes in the HathiTrust Library
Notice: Many classes are sparse for earlier years!
The API can be used to understand HTDL’s entire content.
Try it out at: bit.ly/1P5hwtc

Less occurrences

More occurrences



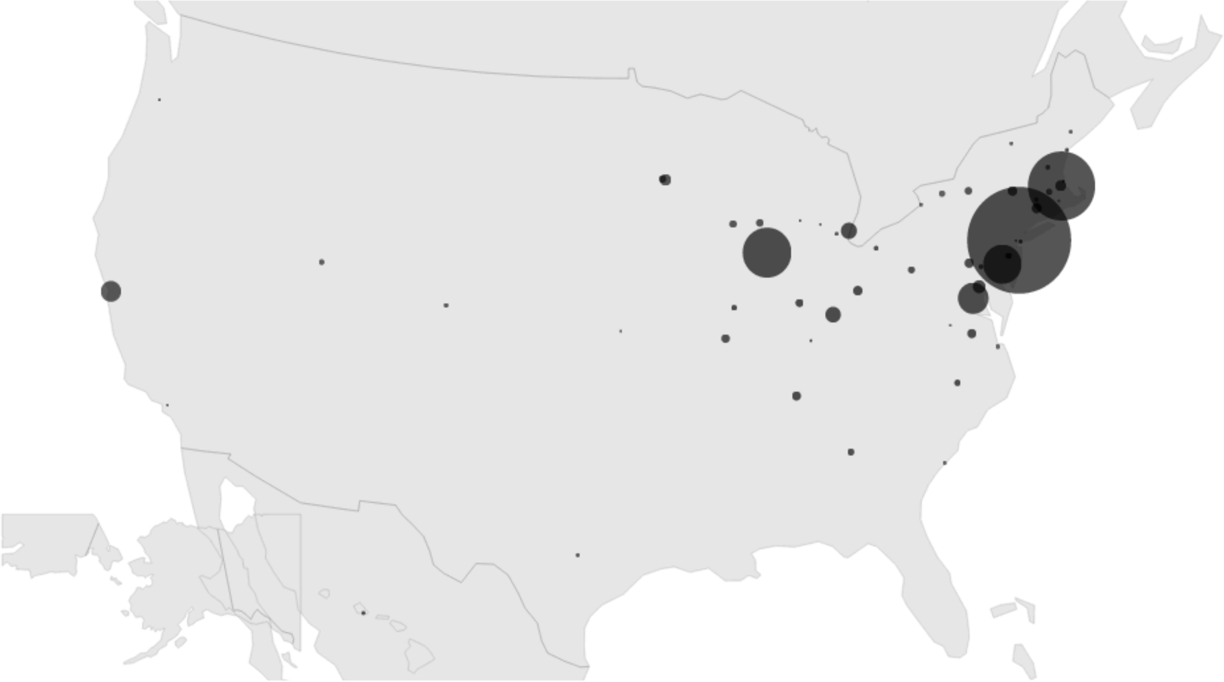


Animated maps via Bookworm API

- Go to bit.ly/1Jjt1R1
- Scroll down to see three successive examples:
  - Number of books published (in the USA) in the HathiTrust Digital Library over time
    - Animation unfolding over places of publication within the USA
  - Number of books published (in Europe), in the HathiTrust Digital Library over time
    - Faceted by language
    - Choose language from the drop-down menu
  - Geography of word use:
    - Type the word in to see where-all it was being used (through displaying place of publication)
    - Click the map to access individual instances of the books

Animated maps via Bookworm API

- Number of books published (in the USA) in the HathiTrust Digital Library over time
- Animation unfolding over places of publication within the USA : bit.ly/1Jjt1R1



Underlying Data for HT+Bookworm?

- HT+Bookworm is powered by a public API that follows the Bookworm querying language
- Documentation: bookworm-project.github.io/Docs/API.html